IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A polymer electrolyte fuel cell comprising:

a plurality of unit cells each having a proton exchange membrane, a fuel electrode provided on one surface of the membrane and having a catalyst layer, and an oxidizer electrode provided on the other surface of the membrane and having a catalyst layer;

a plate reactant-gas supplying separator having, in its one surface that contacts the fuel electrode, ~~reactant~~ fuel-gas supplying passages for supplying ~~reactant~~ fuel gas to the fuel electrode, and having, in its opposite surface that contacts the oxidizer electrode, oxidizer-gas supplying passages for supplying oxidizer gas to the oxidizer electrode~~ of each unit cell~~;

a fuel-gas manifold made in an edge part of the plate reactant-gas supplying separator;

a fuel-gas inlet section provided adjacent to the fuel-gas manifold in the plate reactant gas supplying separator;

a water manifold made in another edge part of plate reactant-gas supplying separator and passing through the plate reactant gas supplying separator; and

a water-supplying ~~means~~ unit ~~for supplying~~ to supply water ~~in liquid state~~ from the water manifold to the ~~reactant~~ fuel-gas supplying passages provided in ~~at least one of the fuel electrode and oxidizer electrode~~ the reactant-gas supplying separator, said water-supplying ~~means~~ unit comprising a header ~~which is~~ provided in ~~a reactant~~ the fuel gas inlet section ~~provided in the reactant gas supplying separator and which mixes reactant~~ to mix the fuel gas with the water, and a water-supplying groove which is made in the same surface of the plate reactant gas supplying separator as the ~~reactant~~ fuel gas supplying passages and which ~~connects~~ communicates with the header and the water manifold.

Claim 2 (Currently Amended): The polymer electrolyte fuel cell according to claim 1, <u>further</u> comprising: ~~a plurality of unit cells each having proton exchange membrane, a fuel electrode provided on one surface of the membrane and having a catalyst layer, and an oxidizer electrode provided on the other surface of the membrane and having a catalyst layer; a reactant gas supplying separator having fuel-gas supplying passages for supplying reactant gas to the fuel electrode to the fuel electrode and oxidizer electrode of each unit cell; a water manifold which passes through at least the reactant-gas supplying separator, water-supplying means for supplying water in liquid state to reactant gas supplying passages which are made in at least one of the fuel electrode and oxidizer electrode, said water-supplying means comprising a header which is provided in a reactant-gas inlet section provided in the reactant-gas supplying separator and which mixes reactant-gas with water, a water-supplying groove which is made in the same surface as the reactant gas supplying passages and which connects the header and the water manifold, and a porous member; a water-supplying groove which is made in the same surface as the reactant gas supplying passages and which connects the header and the water manifold, and;~~ a porous member which is arranged in the water-supplying groove and which has an average pore diameter of 20 [[m]] <u>µm</u> or less, ~~(~~excluding 0 ~~mm~~ <u>µm</u>~~)~~.

Claim 3 (Currently Amended). A power-generating system with polymer electrolyte fuel cells, comprising:

a plurality of unit cells each having a proton exchange membrane, a fuel electrode provided on one surface of the membrane and having a catalyst layer, and an oxidizer electrode provided on the other surface of the membrane and having a catalyst layer;

a reactant-gas supplying separator having<u>, in its one surface that contacts the fuel electrode,</u> ~~reactant~~ <u>fuel-</u>gas supplying passages for supplying ~~reactant~~ <u>fuel</u> gas to the fuel

electrode and having, in its opposite surface that contacts the oxidizer electrode, oxidizer-gas supplying passages for supplying oxidizer gas to the ~~oxidizing~~ oxidizer electrode ~~of each unit cell~~;

a fuel-gas manifold made in an edge part of the plate reactant-gas supplying separator;

a fuel-gas inlet section provided adjacent to the fuel-gas manifold in the plate reactant gas supplying separator;

a water manifold which is made in another edge part of plate reactant-gas supplying separator and passes through the reactant gas supplying separator; and

a water-supplying ~~means~~ unit to supply water ~~in liquid state~~ from the water manifold to the ~~reactant~~ fuel-gas supplying passages made in ~~at least one of the fuel electrode and oxidizer electrode~~ the reactant-gas supplying separator, said water-supplying unit comprising a header provided in the fuel gas inlet section to mix the fuel gas with the water, and a water-supplying groove which is made in the same surface of the plate reactant gas supplying separator as the fuel gas supplying passages and which communicates with the header and the water manifold;

a heat-recovering ~~means for recovering~~ unit to recover heat of water from exhausted fuel gas and oxidizer exhaust gas which are discharged from the unit cells;

a recovered-water supplying ~~means for supplying~~ unit to supply the water recovered in the heat-recovering ~~means~~ unit; and

a water-amount control ~~means for controlling~~ unit to control an amount of water supplied from the recovered-water supplying ~~means~~ unit.

Claim 4 (Currently Amended): A power-generating system with polymer electrolyte fuel cells, comprising:

a plurality of unit cells, each having proton exchange membrane, a fuel electrode provided on one surface of the membrane and having a catalyst layer, and an oxidizer electrode provided on the other surface of the membrane and having a catalyst layer;

a reactant gas supplying separator having, in its one surface that contacts the fuel electrode, ~~reactant~~ fuel-gas supplying passages for supplying ~~reactant~~ fuel gases to the fuel electrode and having, in its opposite surface that contact the oxidizer electrode, oxidizer-gas supplying passages for supplying oxidizer gas to the oxidizing electrode~~ of each unit cell~~;

a fuel-gas manifold made in an edge part of the plate reactant-gas supplying separator;

a fuel-gas inlet section provided adjacent to the fuel-gas manifold in the plate reactant gas supplying separator;

a water manifold which is made in another edge part of plate reactant-gas supplying separator and passes through the reactant gas supplying separator;

a water-supplying ~~means for supplying~~ unit to supply water ~~in liquid state~~ from the water manifold to the ~~reactant~~ fuel-gas supplying passages made in ~~at least one of the fuel electrode and oxidizer electrode~~ the reactant-gas supplying separator, said water-supplying unit comprising a header provided in the fuel gas inlet section to mix the fuel gas with the water, and a water-supplying groove which is made in the same surface of the plate reactant gas supplying separator as the fuel gas supplying passages and which communicates with the header and the water manifold;

a heat-recovering ~~means for recovering~~ unit to recover heat of water from exhausted fuel gas and exhausted oxidizer gas which are discharged from the unit cells;

a recovered-water supplying ~~means for supplying~~ unit to supply the water recovered in the heat-recovering ~~means~~ unit to the unit cells; and

a water-amount control ~~means for controlling~~ unit to control an amount of water supplied from the recovered water supplying ~~means~~ unit, ~~wherein~~ the water-amount control

unit comprising a calculation ~~means for calculating~~ unit to calculate an amount of water to be supplied, from the voltage of electric power generated by each unit cell and the load current of each unit cell, and a metering pump which controls the amount of the recovered water to be supplied, in accordance with a signal representing the result of calculation performed by the calculation ~~means~~ unit.

Claim 5 (Currently Amended): A power-generating system with polymer electrolyte fuel cells, comprising:

a plurality of unit cells, each having proton exchange membrane, a fuel electrode provided on one surface of the membrane and having a catalyst layer, and an oxidizer electrode provided on the other surface of the membrane and having a catalyst layer;

a plate reactant gas supplying separator having, in its one surface that contacts the fuel electrode, ~~reactant~~ fuel-gas supplying passages for supplying ~~reactant~~ fuel gases to the fuel electrode and having, in its opposite surface that contact the oxidizer electrode, oxidizer-gas supplying passages for supplying oxidizer gas to the oxidizing electrode~~ of each unit cell~~;

a fuel-gas manifold made in an edge part of the plate reactant-gas supplying separator;

a fuel-gas inlet section provided adjacent to the fuel-gas manifold in the plate reactant gas supplying separator;

a water manifold which is made in another edge part of plate reactant-gas supplying separator and passes through the reactant gas supplying separator;

a water-supplying ~~means for supplying~~ unit to supply water ~~in liquid state~~ from the water manifold to the reactant gas supplying passages made in at least one of the fuel electrode and oxidizer electrode, said water-supplying unit comprising a header provided in the fuel gas inlet section to mix the fuel gas with the water, and a water-supplying groove

which is made in the same surface of the plate reactant gas supplying separator as the fuel gas supplying passages and which communicates with the header and the water manifold;

a heat-recovering ~~means for recovering~~ unit to recover heat of water from exhausted fuel gas and exhausted oxidizer gas which are discharged from the unit cells;

a recovered-water supplying ~~means for supplying~~ unit to supply the water recovered in the heat-recovering ~~means~~ unit to the unit cells; and

a water-amount control ~~means for controlling~~ unit to control an amount of water supplied from the recovered water supplying means, said water-amount control ~~means~~ unit comprising a calculation ~~means~~ unit which calculates an amount of water to supply, from the voltage of electric power generated by each unit cell and the load current of each unit cell, wherein the calculation ~~means~~ unit calculates the amount W of water (g/min) in accordance with the following equation, and the water-amount control means controls the supply of water to the fuel-gas supplying passages or oxidizer-gas supplying passages, in an amount up to 20 times the value W,

$$W = 30 \cdot I \cdot C \cdot (\Delta H / F - 2V) / h \quad (1)$$

where V is the voltage of electric power (V/cell), I is the load current (A), C is the number of basic units stacked, h is the latent heat of evaporation (J/g), DH is the enthalpy change (J/mol) that occurs when water the cell reaction generates water vapor, and F is the Faraday constant (C/mol).

Claim 6 (New): The power-generating system according to claim 3, further comprising a porous member which is arranged in the water-supplying groove and which has an average pore diameter of 20μm or less, excluding 0 μm.

Claim 7 (New): The power-generating system according to claim 4, further comprising a porous member which is arranged in the water-supplying groove and which has an average pore diameter of 20μm or less, excluding 0 μm.

Claim 8 (New): The power-generating system according to claim 5, further comprising a porous member which is arranged in the water-supplying groove and which has an average pore diameter of 20μm or less, excluding 0 μm.